WHAT IS CLAIMED IS:

1. A method of position-based integrated motion controlled curve sawing comprising the steps of:

(a) transporting a curved workpiece in a downstream direction on a transfer means, and monitoring workpiece position of said workpiece on said transfer means,

(b) scanning said workpiece through an upstream scanner to measure workpiece profiles in spaced apart array along a surface of said workpiece and communicating said workpiece profiles to a digital processor,

(c) computing, by said digital processor, a high order polynomial smoothing curve fitted to said array of workpiece profiles of said curved workpiece, and adjusting said smoothing curve for cutting machine constraints of downstream motion controlled cutting devices to generate an adjusted curve,

(d) generating unique position cams unique to said workpiece from said adjusted curve for optimized cutting by said cutting devices along a tool path corresponding to said position cams,

(e) sequencing said transfer means and said workpiece with said cutting devices, and sequencing said unique position cams corresponding to said workpiece to match said position of said workpiece,

(f) feeding said workpiece, on said transfer means, longitudinally into cutting engagement with said cutting devices, and actively relatively positioning said workpiece and said cutting devices relative to each other according to a time-based

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servo loop updated recalculation, based on said workpiece position, of cutting engagement target position as said workpiece is fed longitudinally so as to position said cutting engagement of said cutting devices along said tool path.

2. The method of claim 1 wherein said high order polynomial smoothing curve is an n^{th} degree modified polynomial of the form $f(x) = a_n x^n + a_{n-1} x^{n-1} + \ldots + a_1 x + a_0$, having co-efficient a_n through a_0, and where said co-efficients a_n through a_0 are generated by said digital processor to correspond to, and for fitting said smoothing curve along, ~~corresponding~~ said workpiece profiles.

3. The method of claim 1 further comprising the steps of monitoring loading of said cutting devices and actively adjusting a feed speed of said feeding of said workpiece to maximize said feed speed.

4. The method of claim 3 further comprising the step of compensating for workpiece density in said adjusting of said feed speed.

5. The method of claim 3 further comprising the step of monitoring density of said workpiece and compensating for said density in said adjusting of said feed speed.

6. The method of claim 1 wherein said monitoring of said position of said workpiece includes encoding translational motion of said transfer means and communicating said encoding to said digital processor.

7. The method of claim 6 wherein said monitoring further comprises communicating trigger signals from an opposed pair of photoeyes, opposed on opposed sides of said transfer means, to said digital processor.

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8. The method of claim 1, wherein said cutting devices include chipping heads, further comprising the steps of:

monitoring density of the workpiece,

monitoring RPM of the chipping heads,

monitoring a feedspeed of the workpiece.

optimizing said RPM of the chipping heads for chip recovery, to prevent chip fines, and to equalize chipping head forces.

9. The method of claim 1 wherein said cutting devices comprise first and second sets of cutting devices spaced apart along said transfer means, and further comprising the steps of skewing said first and second sets of cutting devices about a common axis of rotation, and computing, for said first set of cutting devices, a first cutting line spaced apart from a second cutting line for said second set of cutting devices, said first and second cutting lines computed according to non-linear equations of motion for said first and second sets of cutting devices.

10. A method of position-based integrated motion controlled curve sawing comprising the steps of:

(a) transporting a curved workpiece in a downstream direction on a transfer means, and monitoring workpiece position of said workpiece on said transfer means,

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(b) scanning said workpiece through an upstream scanner to measure workpiece profiles in spaced apart array along a surface of said workpiece and communicating said workpiece profiles to a digital processor,

(c) computing, by said digital processor, a high order polynomial smoothing curve fitted to said array of workpiece profiles of said curved workpiece, and adjusting said smoothing curve for cutting machine constraints of downstream motion controlled cutting devices to generate an adjusted curve,

(d) generating unique position cams unique to said workpiece from said adjusted curve for optimized cutting by said cutting devices along a tool path corresponding to said position cams,

(e) sequencing said transfer means and said workpiece with said cutting devices, and sequencing said unique position cams corresponding to said workpiece to match said position of said workpiece,

(f) feeding said workpiece, on said transfer means, longitudinally into cutting engagement with said cutting devices, and actively relatively positioning said workpiece and said cutting devices relative to each other according to a time-based servo loop updated recalculation, based on said workpiece position, of cutting engagement target position as said workpiece is fed longitudinally so as to position said cutting engagement of said cutting devices along said tool path,

wherein said cutting devices comprise an upstream opposed pair of selectively translatable chipping heads cooperating with a downstream active gangsaw,

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wherein said opposed pair of selectively translatable chipping heads are mounted to, and selectively translatable in a first direction relative to a selectively articulatable gangsaw carriage,

wherein said first direction crosses a linear workpiece feed path wherealong said workpiece may be linearly fed through said active gangsaw so as to first pass between said opposed pair of selectively translatable chipping heads and subsequently pass through said gangsaw,

wherein said gangsaw is mounted to said gangsaw carriage and is selectively positionable linearly in said first direction and simultaneously rotatable about a generally vertical axis to thereby translate and skew said gangsaw carriage relative to said workpiece feed path by selective positioning means acting on said gangsaw carriage.

11. The method of claim 10 wherein said gangsaw carriage is selectively positionable linearly in said first direction by means of translation of said gangsaw carriage along linear guides mounted to a base, and is simultaneously rotatable about said generally vertical axis by means of rotation of said gangsaw carriage about a generally vertical shaft extending between said gangsaw carriage and said base.

12. The method of claim 10 wherein said high order polynomial smoothing curve is an n^{th} degree modified polynomial of the form $f(x) = a_n x^n + a_{n-1} x^{n-1} + \ldots + a_1 x + a_0$, having co-efficient a_n through a_0, and where said co-efficients a_n through a_0 are generated by said digital processor to correspond to, and for fitting said smoothing curve along, ~~corresponding~~ said workpiece profiles.

13. The method of claim 10 further comprising the step of stabilizing said workpiece downstream and adjacent said chipping heads by means of anvils correspondingly

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translatable with said translation of said chipping heads in said first direction, wherein said anvils are formed as chip diverting chutes whereby chips from chipping of said workpiece are directed away from said feed path.

14. The method of claim 10 further comprising the steps of monitoring loading of said cutting devices and actively adjusting a feed speed of said feeding of said workpiece to maximize said feed speed.

15. The method of claim 14 further comprising the step of compensating for workpiece density in said adjusting of said feed speed.

16. The method of claim 14 further comprising the step of monitoring density of said workpiece and compensating for said density in said adjusting of said feed speed.

17. The method of claim 10 wherein said monitoring of said position of said workpiece includes encoding translational motion of said transfer means and communicating said encoding to said digital processor.

18. The method of claim 17 wherein said monitoring further comprises communicating trigger signals from an opposed pair of photoeyes, opposed on opposed sides of said transfer means, to said digital processor.

19. The method of claim 10, wherein said cutting devices include chipping heads, further comprising the steps of:

monitoring density of the workpiece,

monitoring RPM of the chipping heads,

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monitoring a feedspeed of the workpiece.

optimizing said RPM of the chipping heads for chip recovery, to prevent chip fines, and to equalize chipping head forces.

20. A method of position-based integrated motion controlled curve sawing comprising the steps of:

(a) transporting a curved workpiece in a downstream direction on a transfer means, and monitoring workpiece position of said workpiece on said transfer means,

(b) scanning said workpiece through an upstream scanner to measure workpiece profiles in spaced apart array along a surface of said workpiece and communicating said workpiece profiles to a digital processor,

(c) computing, by said digital processor, a high order polynomial smoothing curve fitted to said array of workpiece profiles of said curved workpiece, and adjusting said smoothing curve for cutting machine constraints of downstream motion controlled cutting devices to generate an adjusted curve,

(d) generating unique position cams unique to said workpiece from said adjusted curve for optimized cutting by said cutting devices along a tool path corresponding to said position cams,

(e) sequencing said transfer means and said workpiece with said cutting devices, and sequencing said unique position cams corresponding to said workpiece to match said position of said workpiece,

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(f) translating said workpiece, on transfer means, downstream from said scanner into engagement with positioning means adjacent and upstream of said cutting devices,

(g) feeding said workpiece along a transfer path longitudinally from said positioning means into cutting engagement with said cutting devices, and actively relatively positioning said workpiece and said cutting devices relative to each other according to a time-based servo loop updated recalculation, based on said workpiece position, of cutting engagement target position as said workpiece is fed longitudinally so as to position said cutting engagement of said cutting devices along said tool path,

wherein said positioning means is a positioning roll case and includes means for selectively skewed pre-positioning of said workpiece upstream of a selectively and actively positionable cant reducing means for forming a curved third face on a rough face of said workpiece,

an upstream pair of opposed selectively actively positionable workpiece guides and a downstream pair of opposed selectively actively positionable workpiece guides for actively guiding said workpiece, said upstream pair of guides being downstream of said workpiece reducing means and said downstream pair of guides being upstream of gang saws mounted on a saw arbor,

said upstream and downstream pair of guides aligned, with one guide of each pair of guides generally corresponding to said workpiece reducing means on a first side of said transfer path, said opposed guides in said two pairs of guides in opposed relation on said opposing side of said workpiece transfer path and generally aligned with a second positioning means along said transfer path, said second positioning means in opposed relation to said workpiece reducing means laterally across said transfer path.

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21. The method of claim 20 wherein said high order polynomial smoothing curve is an n^{th} degree modified polynomial of the form $f(x) = a_n x^n + a_{n-1} x^{n-1} + \ldots + a_1 x + a_0$, having co-efficient a_n through a_0, and where said co-efficients a_n through a_0 are generated by said digital processor to correspond to, and for fitting said smoothing curve along, corresponding said workpiece profiles.

22. The method of claim 20 wherein said gangsaws and saw arbor are selectively actively positionable both laterally across said transfer path and rotationally about an axis of rotation perpendicular to said transfer path so as to orient said gangsaws for said cutting engagement along said tool path so as to form a curved face on a rough face of said workpiece and so as to form a corresponding array of parallel cuts by said gangsaws corresponding thereto.

23. The method of claim 20 wherein said selectively actively positionable workpiece reducing means is an opposed pair of selectively actively positionable chipping heads in spaced apart relation on either side laterally across said transfer path.

24. The method of claim 20 wherein said pairs of selectively actively positionable workpiece guides include actively positionable guides on the side of said workpiece corresponding to said actively positionable workpiece reducing means and on the opposing side laterally across said transfer path, said workpiece guides on said side of said transfer path corresponding to said second positioning means.

25. The method of claim 20 further comprising the step of stabilizing said workpiece downstream and adjacent said chipping heads by means of anvils correspondingly translatable with said translation of said chipping heads in said first direction, wherein said anvils are formed as chip diverting chutes whereby chips from chipping of said workpiece are directed away from said feed path.

26. The method of claim 10 further comprising the steps of skewing said chipping heads and said gangsaw about a common axis of rotation, and computing, for each of said chipping heads, chipping lines spaced apart from a sawline calculated for said gangsaw, said chipping lines and said saw line computed according to non-linear equations of motion for said chipping heads and gangsaw respectively.

27. The method of claim 26 further comprising the steps of detecting potential side board material in said workpiece from said workpiece profiles, and computing said chipping lines and sawline so as to accurately cut a side board of controlled thickness therebetween during said feeding of said workpiece.

28. The method of claim 20, wherein said cutting devices include chipping heads, further comprising the steps of:

monitoring density of the workpiece,

monitoring RPM of the chipping heads,

monitoring a feedspeed of the workpiece.

optimizing said RPM of the chipping heads for chip recovery, to prevent chip fines, and to equalize chipping head forces.

29. The method of claim 1, 10 or 20 further comprising the steps of monitoring for flares or bulges on said workpiece and reducing said flares or bulges by a workpiece reducing means upstream of said cutting devices.

30. A method of position-based integrated motion controlled curve sawing comprising the steps of:

(a) transporting a curved workpiece in a downstream direction on a transfer means, and monitoring workpiece position of said workpiece on said transfer means,

(b) scanning said workpiece through an upstream scanner to measure workpiece profiles in spaced apart array along a surface of said workpiece and communicating said workpiece profiles to a digital processor,

(c) computing, by said digital processor, a high order polynomial smoothing curve fitted to said array of workpiece profiles of said curved workpiece, and adjusting said smoothing curve for cutting machine constraints of downstream motion controlled cutting devices to generate an adjusted curve,

(d) generating unique position cams unique to said workpiece from said adjusted curve for optimized cutting by said cutting devices along a tool path corresponding to said position cams,

(e) sequencing said transfer means and said workpiece with said cutting devices, and sequencing said unique position cams corresponding to said workpiece to match said position of said workpiece,

(f) translating said workpiece, on transfer means, downstream from said scanner into engagement with positioning means adjacent and upstream of said cutting devices,

(g) feeding said workpiece longitudinally from said positioning means into cutting engagement with said cutting devices, and actively relatively positioning said

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workpiece and said cutting devices relative to each other according to a time-based servo loop updated recalculation, based on said workpiece position, of cutting engagement target position as said workpiece is fed longitudinally so as to position said cutting engagement of said cutting devices along said tool path,

wherein a first cutting device of said cutting devices comprises a workpiece profiling means for opening at least a third longitudinal face on a workpiece, wherein said third face is generally perpendicular to first and second opposed generally parallel and planar faces of said workpiece, and curved in correspondence with said position cams so as to form an optimized profile along said third face,

(h) transferring, on said transfer means, said workpiece from said workpiece profiling means to a workpiece skewing and pre-positioning means,

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(i) selectively and actively controllably ~~controllable~~ positioning ~~of~~ said workpiece on said skewing and pre-positioning means for selectively aligned feeding of said workpiece longitudinally into workpiece guiding means,

(j) selectively actively laterally guiding and longitudinally feeding said workpiece in said guiding means as said workpiece is translated between said workpiece skewing and pre-positioning means and a lateral array of generally vertically aligned spaced apart saws so as to position said third face of said workpiece for guiding engagement with workpiece positioning means, within said workpiece guiding means,

(k) selectively actively applying lateral positioning force, by said positioning means, to said third face to selectively actively position said workpiece within said

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workpiece guiding means as said workpiece is fed longitudinally into said lateral array of generally vertically aligned spaced apart saws.

31. A method of position-based integrated motion controlled curve sawing comprising the steps of:

(a) transporting a curved workpiece in a downstream direction on a transfer means, and monitoring workpiece position of said workpiece on said transfer means,

(b) scanning said workpiece through an upstream scanner to measure workpiece profiles in spaced apart array along a surface of said workpiece and communicating said workpiece profiles to a digital processor,

(c) computing, by said digital processor, a high order polynomial smoothing curve fitted to said array of workpiece profiles of said curved workpiece, and adjusting said smoothing curve for cutting machine constraints of downstream motion controlled cutting devices to generate an adjusted curve,

(d) generating unique position cams unique to said workpiece from said adjusted curve for optimized cutting by said cutting devices along a tool path corresponding to said position cams,

(e) sequencing said transfer means and said workpiece with said cutting devices, and sequencing said unique position cams corresponding to said workpiece to match said position of said workpiece,

(f) translating said workpiece, on transfer means, downstream from said scanner into engagement with positioning means adjacent and upstream of said cutting devices,

(g) feeding said workpiece longitudinally from said positioning means into cutting engagement with said cutting devices, and actively relatively positioning said workpiece and said cutting devices relative to each other according to a time-based servo loop updated recalculation, based on said workpiece position, of cutting engagement target position as said workpiece is fed longitudinally so as to position said cutting engagement of said cutting devices along said tool path,

(h) profiling, in said cutting devices, a workpiece by a workpiece profiling means to open at least a third longitudinal face on a workpiece wherein said third face is generally perpendicular to said first and second opposed generally parallel and planar faces of said workpiece, said profiling being according to said position cams generated for said workpiece so as to form an optimized profile along said third face,

(i) transferring said workpiece by said workpiece transfer means from said workpiece profiling means to a workpiece skewing and pre-positioning means,

(j) skewing and pre-positioning said workpiece by said workpiece skewing and pre-positioning means to selectively and actively controllably position said workpiece for selectively aligned feeding of said workpiece longitudinally into workpiece guiding means,

(k) guiding said workpiece by said workpiece guiding means for selectively actively laterally guiding and longitudinally feeding said workpiece as said workpiece is translated between said workpiece skewing pre-positioning means and a lateral array of generally vertically aligned spaced apart saws,

(l) positioning said third face of said workpiece by second workpiece positioning means within said workpiece guiding means so as to position said third face of said workpiece for guiding engagement with said workpiece positioning means, said workpiece positioning means for selectively actively applying lateral positioning force to said third face to selectively actively position said workpiece within said workpiece guiding means as said workpiece is fed longitudinally into said lateral array of generally vertically aligned spaced apart saws,

(m) feeding said workpiece longitudinally from said workpiece guiding means into said lateral array of generally vertically aligned spaced apart saws.

32. The method of claim 30 wherein said workpiece profiling means opens both said third and a fourth longitudinal face on said workpiece, wherein said third and fourth faces are generally perpendicular to said first and second opposed generally parallel planar faces of said workpiece and are themselves generally opposed faces, and wherein within said workpiece guiding means said workpiece positioning means comprise laterally opposed first and second positioning force means corresponding to said third and fourth faces respectively to, respectively, actively apply lateral positioning force to selectively actively position said workpiece within said workpiece guiding means.

33. The method of claim 31 wherein said workpiece profiling means opens both said third and a fourth longitudinal face on said workpiece wherein said third and fourth faces are generally perpendicular to said first and second opposed generally parallel planar faces of said workpiece and are themselves generally opposed faces, and wherein within said workpiece guiding means said workpiece positioning means comprise laterally opposed first and second positioning force means corresponding to said third and fourth faces respectively to, respectively, actively apply lateral positioning force to selectively actively position said workpiece within said workpiece guiding means.

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34. The method of claim 32 wherein said first and second laterally opposed positioning force means each comprise a longitudinally spaced apart plurality of positioning force means.

35. The method of claim 33 wherein said first and second laterally opposed positioning force means each comprise a longitudinally spaced apart plurality of positioning force means.

36. The method of claim 34 wherein said first positioning force means include, when in guiding engagement with said third face, longitudinal driving means for urging said workpiece longitudinally within said workpiece guiding means.

37. The method of claim 35 wherein said first positioning force means include, when in guiding engagement with said third face, longitudinal driving means for urging said workpiece longitudinally within said workpiece guiding means.

38. The method of claims 20, 30 or 31 further comprising the steps of monitoring loading of said cutting devices and actively adjusting a feed speed of said feeding of said workpiece to maximize said feed speed.

39. The method of claim 38 further comprising the step of compensating for workpiece density in said adjusting of said feed spced.

40. The method of claim 38 further comprising the step of monitoring density of said workpiece and compensating for said density in said ~~adjust~~ adjusting of said feed speed.

41. The method of claims 20, 30 or 31 wherein said monitoring of said position of said workpiece includes encoding translational motion of said transfer means and communicating said encoding to said digital processor.

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42. The method of claim 41 wherein said monitoring further comprises communicating trigger signals from an opposed pair of photoeyes, opposed on opposed sides of said transfer means, to said digital processor.

43. The method of claims 30 or 31, wherein said cutting devices include chipping heads, further comprising the steps of:

monitoring density of the workpiece,

monitoring RPM of the chipping heads,

monitoring a feedspeed of the workpiece.

optimizing said RPM of the chipping heads for chip recovery, to prevent chip fines, and to equalize chipping head forces.

44. A position-based integrated motion controlled curve sawing device comprising an upstream opposed pair of selectively translatable chipping heads cooperating with a downstream active gangsaw,

wherein said opposed pair of selectively translatable chipping heads are mounted to, and selectively translatable in a first direction relative to a selectively articulatable gangsaw carriage,

wherein said first direction crosses a linear workpiece feed path wherealong said workpiece may be linearly fed through said active gangsaw so as to first pass between said opposed pair of selectively translatable chipping heads and subsequently pass through said gangsaw,

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wherein said gangsaw is mounted to said gangsaw carriage and is selectively positionable linearly in said first direction and simultaneously rotatable about a generally vertical axis to thereby translate and skew said gangsaw carriage relative to said workpiece feed path by selective positioning means acting on said gangsaw carriage.

45. The device of claim 44 wherein said gangsaw carriage is selectively positionable linearly in said first direction by means of translation of said gangsaw carriage along linear guides mounted to a base, and is simultaneously rotatable about said generally vertical axis by means of rotation of said gangsaw carriage about a generally vertical shaft extending between said gangsaw carriage and said base.

46. The device of claim 44 further comprising anvils for stabilizing said workpiece downstream and adjacent said chipping heads, said anvils correspondingly translatable with said translation of said chipping heads in said first direction, wherein said anvils are formed as chip diverting chutes whereby chips from chipping of said workpiece are directed away from said feed path.

~~47.~~ 44 A position-based integrated motion controlled curve sawing device comprising positioning means for selectively skewed pre-positioning of a workpiece, selectively translatable along a transfer path, upstream of a selectively and actively positionable workpiece ~~cant~~ reducing means for forming a curved third face on a rough face of said workpiece,

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an upstream pair of opposed selectively actively positionable workpiece guides and a downstream pair of opposed selectively actively positionable workpiece guides for actively guiding said workpiece, said upstream pair of guides being downstream of said workpiece reducing means and said downstream pair of guides being upstream of gang saws mounted on a saw arbor,

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said upstream and downstream pair of guides aligned, with one guide of each pair of guides generally corresponding to said workpiece reducing means being on a first side of said transfer path, said opposed guides in said two pairs of guides being in opposed relation on said opposing side of said workpiece transfer path and being generally aligned with a second positioning means along said transfer path, said second positioning means being in opposed relation to said workpiece reducing means laterally across said transfer path.

~~48.~~ 45 The device of claim ~~47~~ 44 wherein said gangsaws and saw arbor are selectively actively positionable both laterally across said transfer path and rotationally about an axis of rotation perpendicular to said transfer path so as to orient said gangsaws for said cutting engagement along an optimized tool path so as to form a curved face on a rough face of said workpiece and so as to form a corresponding array of parallel cuts by said gangsaws corresponding thereto.

~~49.~~ 46 The device of claim ~~47~~ 44 wherein said selectively actively positionable workpiece reducing means ~~is~~ comprises an opposed pair of selectively actively positionable chipping heads in spaced apart relation on either side laterally across said transfer path.

~~50.~~ 47 The device of claim ~~49~~ 44 further comprising anvils for stabilizing said workpiece downstream and adjacent said chipping heads, said anvils being correspondingly translatable with said translation of said chipping heads in said first direction, wherein said anvils are formed as chip diverting chutes whereby chips from chipping of said workpiece are directed away from said feed path.

~~51.~~ 48 A position-based integrated motion controlled curve sawing device comprising a workpiece profiling means for opening at least a third longitudinal face on a workpiece, wherein said third face is generally perpendicular to first and second opposed generally

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parallel and planar faces of said workpiece and curved in correspondence with position cams so as to form an optimized profile along said third face,

workpiece transfer means for transferring said workpiece from said workpiece profiling means to a workpiece skewing and pre-positioning means,

workpiece skewing and pre-positioning means for selectively and actively controllable positioning of said workpiece for selectively aligned feeding of said workpiece longitudinally into workpiece guiding means,

workpiece guiding means for selectively actively laterally guiding and longitudinally feeding said workpiece as said workpiece is translated between said workpiece skewing and pre-positioning means and a lateral array of generally vertically aligned spaced apart saws so as to position said third face of said workpiece for guiding engagement with workpiece positioning means, within said workpiece guiding means,

workpiece positioning means for selectively actively applying lateral positioning force to said third face to selectively actively position said workpiece within said workpiece guide means as said workpiece is fed longitudinally into said lateral array of generally vertically aligned spaced apart saws.

49 ~~52~~. The device of claim 48 ~~51~~ wherein said workpiece profiling means opens both said third face and a longitudinal fourth face on said workpiece, wherein said third and fourth faces are generally perpendicular to said first and second opposed generally parallel planar faces of said workpiece and are themselves generally opposed faces, and wherein within said workpiece guiding means said workpiece positioning means comprise laterally opposed first and second positioning force means corresponding to said third and fourth faces

respectively to, respectively, actively apply lateral positioning force to selectively actively position said workpiece within said workpiece guiding means.

50 ~~53.~~ The device of claim 49 ~~52~~ wherein said first and second laterally opposed positioning force means each comprise a longitudinally spaced apart plurality of positioning force means.

51 ~~54.~~ The device of claim 50 ~~53~~ wherein said first positioning force means include, when in guiding engagement with said third face, longitudinal driving means for urging said workpiece longitudinally within said workpiece guiding means.

52 ~~55.~~ A position-based integrated motion controlled curve sawing device comprising transfer means for transporting a curved workpiece in a downstream direction and monitoring means for monitoring workpiece position of said workpiece on said transfer means, an upstream scanner for scanning said workpiece through an upstream scanner to measure workpiece profiles in spaced apart array along a surface of said workpiece and communication means for communicating said workpiece profiles to a digital processor, said digital processor computing a high order polynomial smoothing curve fitted to said array of workpiece profiles of said curved workpiece, adjusting said smoothing curve for cutting machine constraints of downstream motion controlled cutting devices to generate an adjusted curve, generating unique position cams unique to said workpiece from said adjusted curve for optimized cutting by said cutting devices along a tool path corresponding to said position cams, sequencing said transfer means and said workpiece with said cutting devices, and sequencing said unique position cams corresponding to said workpiece to match said position of said workpiece, said transfer means feeding said workpiece longitudinally into cutting engagement with said cutting devices, positioning means actively relatively positioning said workpiece and said cutting devices relative to each other according to a time-based servo loop updated recalculation, based on said workpiece position, of cutting engagement target position as said workpiece is fed

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longitudinally so as to position said cutting engagement of said cutting devices along said tool path.

53 ~~56.~~ A position-based integrated motion controlled curve sawing device according to claim ~~55~~ 53 further comprising an upstream opposed pair of selectively translatable chipping heads cooperating with a downstream active gangsaw,

wherein said opposed pair of selectively translatable chipping heads are mounted to, and selectively translatable in a first direction, relative to a selectively articulatable gangsaw carriage,

wherein said first direction crosses a linear workpiece feed path wherealong said workpiece may be linearly fed through said active gangsaw so as to first pass between said opposed pair of selectively translatable chipping heads and subsequently pass through said gangsaw,

wherein said gangsaw is mounted to said gangsaw carriage and is selectively positionable linearly in said first direction and simultaneously rotatable about a generally vertical axis to thereby translate and skew said gangsaw carriage relative to said workpiece feed path by selective positioning means acting on said gangsaw carriage.

54 ~~57.~~ The device of claim ~~56~~ 53 wherein said gangsaw carriage is selectively positionable linearly in said first direction by means of translation of said gangsaw carriage along linear guides mounted to a base, and is simultaneously rotatable about said generally vertical axis by means of rotation of said gangsaw carriage about a generally vertical shaft extending between said gangsaw carriage and said base.

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~~58.~~ 55. The device of claim ~~56~~ 53 further comprising anvils for stabilizing said workpiece downstream and adjacent said chipping heads, said anvils being correspondingly translatable with said translation of said chipping heads in said first direction, wherein said anvils are formed as chip diverting chutes whereby chips from chipping of said workpiece are directed away from said feed path.

~~59.~~ 56. A position-based integrated motion controlled curve sawing device according to claim ~~55~~ 52 further comprising positioning means for selectively skewed pre-positioning of a workpiece, selectively translatable along a transfer path, upstream of a selectively and actively positionable ~~cant~~ workpiece reducing means for forming a curved third face on a rough face of said workpiece,

an upstream pair of opposed selectively actively positionable workpiece guides and a downstream pair of opposed selectively actively positionable workpiece guides for actively guiding said workpiece, said upstream pair of guides being downstream of said workpiece reducing means and said downstream pair of guides being upstream of gang saws mounted on a saw arbor,

said upstream and downstream pair of guides being aligned, with one guide of each pair of guides generally corresponding to said workpiece reducing means on a first side of said transfer path, said opposed guides in said two pairs of guides in opposed relation on said opposing side of said workpiece transfer path and being generally aligned with a second positioning means along said transfer path, said second positioning means being in opposed relation to said workpiece reducing means laterally across said transfer path.

~~60.~~ 57. The device of claim ~~59~~ 56 wherein said gangsaws and saw arbor are selectively actively positionable both laterally across said transfer path and rotationally about an axis of rotation perpendicular to said transfer path so as to orient said gangsaws for said cutting

engagement along an optimized tool path so as to form a curved face on a rough face of said workpiece and so as to form a corresponding array of parallel cuts by said gangsaws corresponding thereto.

58 ~~61.~~ The device of claim 56 ~~59~~ wherein said selectively actively positionable workpiece reducing means is an opposed pair of selectively actively positionable chipping heads in spaced apart relation on either side laterally across said transfer path.

59 ~~62.~~ The device of claim 58 ~~61~~ further comprising anvils for stabilizing said workpiece downstream and adjacent said chipping heads, said anvils correspondingly translatable with said translation of said chipping heads in said first direction, wherein said anvils are formed as chip diverting chutes whereby chips from chipping of said workpiece are directed away from said feed path.

60 ~~63.~~ An integrated motion controlled curve sawing device according to claim 52 ~~55~~ further comprising a workpiece profiling means for opening at least a third longitudinal face on a workpiece, wherein said third face is generally perpendicular to first and second opposed generally parallel and planar faces of said workpiece and curved in correspondence with position cams so as to form an optimized profile along said third face,

workpiece transfer means for transferring said workpiece from said workpiece profiling means to a workpiece ~~skewing and pre-positioning means~~, skewing and pre-positioning means,

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workpiece skewing and pre-positioning means for selectively and actively controllable positioning of said workpiece for selectively aligned feeding of said workpiece longitudinally into workpiece guiding means,

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workpiece guiding means for selectively actively laterally guiding and longitudinally feeding said workpiece as said workpiece is translated between said workpiece skewing and pre-positioning means and a lateral array of generally vertically aligned spaced apart saws so as to position said third face of said workpiece for guiding engagement with workpiece positioning means, within said workpiece guiding means,

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workpiece positioning means for selectively actively applying lateral positioning force to said third face to selectively actively position said workpiece within said workpiece ~~guide~~ guiding means as said workpiece is fed longitudinally into said lateral array of generally vertically aligned spaced apart saws.

61 ~~64~~. The device of claim ~~63~~ 60 wherein said workpiece profiling means opens both said third face and a longitudinal fourth face on said workpiece, wherein said third and fourth faces are generally perpendicular to said first and second opposed generally parallel planar faces of said workpiece and are themselves generally opposed faces, and wherein within said workpiece guiding means said workpiece positioning means comprise laterally opposed first and second positioning force means corresponding to said third and fourth faces respectively to, respectively, actively apply lateral positioning force to selectively actively position said workpiece within said workpiece guiding means.

62 ~~65~~. The device of claim ~~64~~ 61 wherein said first and second laterally opposed positioning force means each comprise a longitudinally spaced apart plurality of positioning force means.

63 ~~66~~. The device of claim ~~65~~ 62 wherein said first positioning force means include, when in guiding engagement with said third face, longitudinal driving means for urging said workpiece longitudinally within said workpiece guiding means.

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~~67.~~ 64. The device of claims ~~55, 56, 59~~ 52, 53, 56 or ~~63~~ 60 further comprising a load monitor, for monitoring loading of said cutting devices, cooperating with means for actively adjusting a feed speed of said feeding of said workpiece to maximize said feed speed.

~~68.~~ 65. The device of claim ~~67~~ 64 further comprising means for compensating for workpiece density cooperating with said means for actively adjusting said feed speed.

~~69.~~ 66. The device of claim ~~67~~ 64 further comprising a density monitor for monitoring density of said workpiece and means for compensating for said density in said adjusting of said feed speed.

~~70.~~ 67. The device of claims ~~55, 56, 59~~ 52, 53, 56 or ~~63~~ 60 wherein said position monitor for monitoring of said position of said workpiece includes a translational motion encoder for encoding translational motion of said transfer means and means for communicating said encoding to said digital processor.

~~71.~~ 68. The device of claim ~~70~~ 67 wherein said position monitor further comprises an opposed pair of photoeyes, opposed on opposed sides of said transfer means, and means for communicating trigger signals from said photoeyes to said digital processor.

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